



National University of Sciences and Technology

Course Description

Course Title	Course Code	Credit Hours
Advanced Stress Analysis	ME 838	3 – 0

Textbook:

- K. Ramesh, Digital Photoelasticity – Advanced Techniques and Applications, Springer.

Reference Book:

- W.N. Sharpe (Ed.), Springer Handbook of Experimental Solid Mechanics, Springer.
- J.W. Dally and W.F. Riley, Experimental Stress Analysis, McGrawHill.
- L.S. Srinath, M.R. Raghavan, K. Lingaiah, G. Gargesa, B. Pant, and K. Ramachandra, Experimental Stress Analysis, Tata McGraw Hill.

Course Objective:

- Enable students to master advanced techniques in stress analysis, fostering their ability to evaluate and design resilient mechanical structures under complex loading conditions.

Course Outline:

- Overview of Experimental Stress Analysis, Stress analysis – Analytical, Numerical and Experimental approaches, Specific domain of these approaches, Advantages and disadvantages.
- Theory and applications of methods in experimental mechanics for measuring static and dynamic deformation of 2-D and 3-D models and bending of plates and shells.
- Techniques of electric resistance strain gage, photoelasticity, moire, holographic interferometry, laser speckle interferometry, moire interferometry, caustics, optical correlation by computer vision.
- Introduction to Three-Dimensional Photoelasticity and Digital Photoelasticity. Applications to problems in fracture mechanics, composite mechanics, interface mechanics and micromechanics

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%